

Identification of the Range of Alternatives



Advisory Committee
December 8, 2005

Purpose of this Session

- ◆ **Review overall methodology to define Final Range of Alternatives**
- ◆ **Confirm Broad Screening Criteria**
- ◆ **Confirm results of application of Broad Screening Criteria to concepts identified during scoping process**
- ◆ **Identify Concepts that will be used to define Configurations**

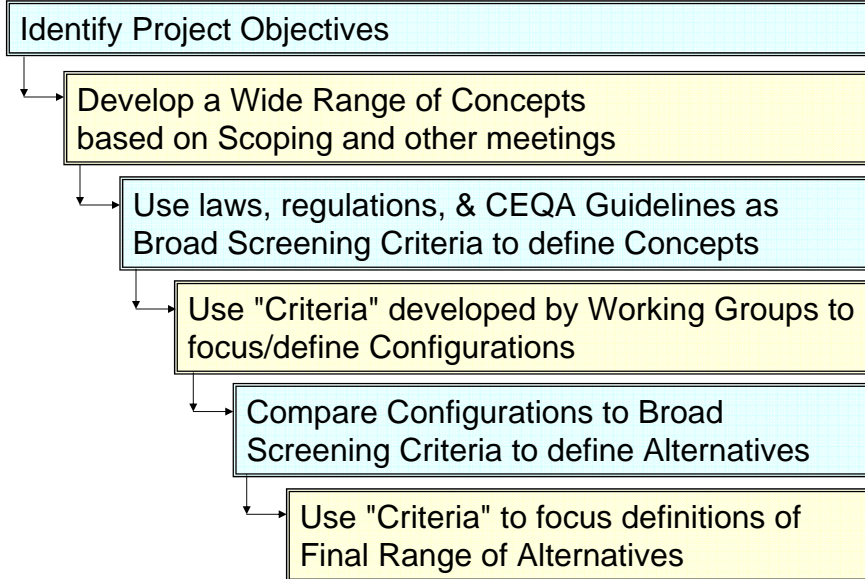
CEQA Defines a Reasonable Range of Alternatives as:

- ◆ **Range of alternatives must permit a reasoned choice**
- ◆ **Range of alternatives usually includes those that would substantially lessen or avoid significant effects of the project**
- ◆ **Alternatives must feasibly attain most of the basic objectives of the project**

CEQA: Definition of "Feasibility"

- ◆ **Site suitability**
- ◆ **Economic viability**
- ◆ **Availability of infrastructure**
- ◆ **General plan consistency**
- ◆ **Regulatory limitations**
- ◆ **Jurisdictional boundaries**
- ◆ **Ability to legally acquire, control, or have access to the site**

Approach to Define Alternatives



Definitions of Terms

- ◆ **Concept:** Generalized approach, such as "Whole Sea" or "Partial Sea" - no details developed related to sizing or facility locations
- ◆ **Configuration:** More details provided including overall sizing, habitat types, general facility locations, and preliminary range of costs
- ◆ **Alternative:** More specific details to allow impact assessment including placement and descriptions of habitat types, facilities, monthly inflow and water quality patterns, preliminary construction material estimates and costs

Step 1: Identify Project Objectives

Project Objectives per Legislation and Statutory Mandates

- ◆ **Restore long-term stable aquatic and shoreline habitat for historic levels and diversity of fish and wildlife that depend upon Salton Sea**
- ◆ **Restoration of the Salton Sea ecosystem and permanent protection of wildlife dependent on that ecosystem**
- ◆ **Protect federal and state listed species**
- ◆ **Protect water quality to support beneficial uses**
- ◆ **Eliminate air quality impacts due to restoration**
- ◆ **Continued use of Salton Sea as a permanent drainage reservoir**
- ◆ **Assess protection of recreational opportunities and creation of opportunities for improved local economic conditions**

Project Objectives have been
Interpreted to Reduce Uncertainty

- ◆ **Historic levels/diversity relative to recent habitat**
- ◆ **Long-term stable aquatic and shoreline habitat**
 - Not at a specific elevation - but stable over study period
 - Protect during climatological and seismic events
- ◆ **Restoration of the Salton Sea ecosystem**
 - In-Sea and within basin areas including rivers and drains
- ◆ **Protection of water quality for ecosystem**
 - Reduce nutrients to minimize eutrophication
 - Reduce selenium to minimize problems to human health and wildlife populations
- ◆ **Eliminate air quality impacts due to restoration**
 - Cannot increase air quality impacts over study period
 - Construction activities must be in air quality compliance

Step 2: Develop Wide Range of
Possible Concepts

Overall Concepts to Define Wide Range of Alternatives

- ◆ **Restoration objectives include actions inside and outside the sea-bed**
- ◆ **Restoration actions inside the sea-bed would support historic habitat functions and values**
- ◆ **Restoration actions outside the sea-bed would support wildlife that are dependent upon the restored Salton Sea**
 - Similar for all alternatives
 - Defined in site-specific analyses

Inside Sea-Bed Concepts to Support Habitat Identified in Scoping

- ◆ **Whole Sea Concepts**
 - Salton Sea same size as existing sea with marine salinity, estuaries/deltas, and offsite salt disposal
- ◆ **Partial Sea Concepts - North & South Sea**
 - Smaller Salton Sea than existing sea with marine salinity, functional equivalent of estuaries/deltas, and onsite or offsite salt disposal
- ◆ **Minimal Barrier Concept**
 - At least 75% of area with salinities from 20,000 to 60,000 mg/L, function and values of shoreline & estuaries/deltas, and onsite or offsite salt disposal
 - Three habitat types with water depths between 0 to 6 feet

Habitat Objectives Discussed at Advisory Committee Define Restoration Actions

◆ **Include water with marine salinity conditions**

- 30,000 to 40,000 mg/L salinity

◆ **Promote habitat diversity by maintaining a mosaic of habitat types within and adjacent to the Salton Sea**

- Maintain function and value of estuaries/deltas
- Maintain function and value of deep sea

◆ **Comply with water quality regulations to support beneficial uses**

◆ **Comply with endangered species regulations**

Habitat Objectives - continued

◆ **Incorporate flexibility**

- Address current uncertainties through adaptive management
- Provide capability to respond to future changes in conditions and status of individual species

◆ **Develop a monitoring and adaptive management plan**

- Generate data that will reduce uncertainty and build scientific basis for future management

All Concepts would Require Disposals of Salts

- ◆ **Export to Gulf of California or Pacific Ocean**
- ◆ **Export to dry lake beds near Salton Sea**
- ◆ **Evaporation ponds (brine sink) inside Sea-Bed**
- ◆ **Evaporation ponds (brine sink) on agricultural lands adjacent to Salton Sea**
- ◆ **Groundwater injection to deep strata**
- ◆ **Solar ponds**

Integration with Other Projects through Cumulative Analyses

- ◆ **Other Potential Projects in 75 Years**
 - Transportation Canal between Salton Sea and Gulf of California
 - Desalinate water and use for municipal uses with discharge of residuals to brine export method
 - Construction of non-restoration facilities inside sea-bed (ie, reservoirs)
 - Expansion of geothermal facilities
 - Restoration of exposed lands for agricultural or other uses
- ◆ **Projects are speculative and potential effects considered in Cumulative Impacts**

Step 3: - Define Range of Configurations by comparing Legal and Regulatory Mandates and CEQA Guidance (Broad Criteria) to Range of Concepts

Whole Sea Concepts

Import water and Export salts from/to Gulf of California or Pacific Ocean



Not within California jurisdiction - Does not meet Broad Criteria - Evaluate as a Configuration due to public comments

Import water from Colorado River and Export salts to site near Sea



Water not legally available - Does not meet Broad Criteria

Import wastewater effluent and Export salts to site near Sea



Adequate flows not available - Does not meet Broad Criteria

Whole Sea Concepts - continued

Three step process:

1. Use reverse osmosis to remove salts from inflows
2. Inject water from sea into groundwater for subsequent withdrawal to add to inflows
3. Construct solar ponds to reduce salts, manage brine from reverse osmosis, and generate electricity

This concept requires adequate groundwater to maintain a Whole Sea.

Previous studies indicate that withdrawal of large amounts of groundwater may impact geothermal operations, cause subsidence, and may not be feasible due to soil permeability - Does not meet Broad Criteria

Partial Sea Concepts for Water Management

North Sea created by barrier.

South Sea created by barrier.

Concentric Rings

Do not provide pupfish connectivity or habitat diversity without extension of water along shorelines - Evaluate as North Sea Combined and South Sea Combined Configurations

Provides pupfish habitat - Consistent with Broad Criteria - Evaluate as a Configuration

All concepts assume disposal of salts either in-sea or off-site

Minimal Barrier Concepts - No Deep, Marine Sea

Provide mosaic of shallow and deeper habitat. Export salts either in-sea or off-site.

Provides pupfish habitat - Consistent with Broad Criteria - Evaluate as a Configuration

Concepts to Export Salt and Maintain Salinity

Export to Gulf of California or Pacific Ocean for Import/Export concepts

Not within jurisdiction - Does not meet Broad Criteria - Include only for Import/Export to Ocean

Export to dry lake bed- would require lining of lake to protect groundwater

Previous studies: Could impact listed species on lake bed - Does not meet Broad Criteria

Inject saltwater into deep groundwater near Sea

Previous studies: May not have capacity & may impact geothermal - Does not meet Broad Criteria

Concepts to Export Salt and Maintain Salinity - continued

Discharge to evaporation ponds (brine sinks) within sea-bed



Would reduce exposed playa - Consistent with Broad Criteria - Evaluate as a Configuration

Export to evaporation ponds (brine sinks) outside of sea-bed (generally on agricultural land)



Consistent with Broad Criteria - however, impacts to prime ag. land and an available concept that would reduce air quality management - Do not Evaluate as a Configuration

Concepts to Export Salt and Maintain Salinity - continued

Use of solar gradient ponds - Similar to evaporation ponds but could be used to generate electricity



Pilot studies: Difficulties due to extensive gypsum fouling. Issues may be manageable - Consider in site-specific studies as an option to evaporation pond (brine sink)

Summary of the Application of Broad Screening Criteria

◆ **Concepts recommended for additional considerations**

- Import water from Gulf of California or Pacific Ocean Whole Sea
 - ◆ Export salts to Gulf of California or Pacific Ocean
- North Sea Combined and South Sea Combined Partial Sea
 - ◆ Salt disposal into in-sea brine sink
- Concentric Rings Partial Sea
 - ◆ Salt disposal in in-sea brine sink
- Minimal Barrier
 - ◆ Salt disposal in in-sea brine sink